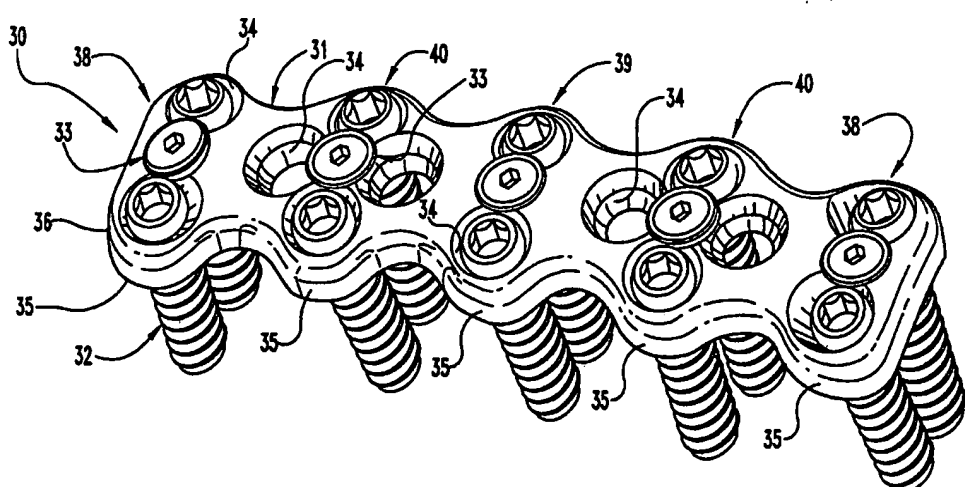




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification <sup>6</sup> : <b>A61B 17/70, 17/80</b></p>	<p><b>A3</b></p>	<p>(11) International Publication Number: <b>WO 98/51226</b> (43) International Publication Date: 19 November 1998 (19.11.98)</p>
<p>(21) International Application Number: PCT/US98/09634 (22) International Filing Date: 12 May 1998 (12.05.98) (30) Priority Data: 08/856,902 15 May 1997 (15.05.97) US (71) Applicant (for all designated States except US): SDGI HOLDINGS, INC. [US/US]; Suite 508, 300 Delaware Avenue, Wilmington, DE 19801 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): FARRIS, Robert, A. [US/US]; 981 Robin Hood Lane, Memphis, TN 38111 (US). POYNER, Jeffrey, Wade [US/US]; 234 Oxford Drive, Atoka, TN 38004 (US). SONNTAG, Volker, K., H. [US/US]; 5202 East Exeter Boulevard, Phoenix, AZ 85018 (US). HAID, Regis, W., Jr. [US/US]; 2995 Devonshire Place, Atlanta, GA 30327 (US). PAPADOPOULOS, Stephen, M. [US/US]; 2465 Adare Road, Ann Arbor, MI 48109 (US). (74) Agents: REEVES, Charles, R. et al.; Woodard, Emhardt, Naughton, Moriarty &amp; McNett, Bank One Center/Tower, Suite 3700, 111 Monument Circle, Indianapolis, IN 46204 (US).</p>		<p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i> (88) Date of publication of the international search report: 18 February 1999 (18.02.99)</p>
<p>(54) Title: ANTERIOR CERVICAL PLATING SYSTEM</p>  <p>(57) Abstract</p> <p>In one embodiment of the invention, an anterior fixation system (30) includes a plate (31a-31g) defining a plurality of screw holes (34), a number of screws (32) and a number of locking assemblies (33) for fixing the screws (32) to the plate (31a-31g). The system (30) includes two bone screws (32), a fixed angle screw (50) and a variable angle screw (60). Either the fixed or variable angled screws (50, 60) may be implanted with a single plate (31a-31g), and either type of screw (50, 60) may be placed into any of the screw holes (34) along the plate (31a-31g). The several screw holes (34) may be in various patterns (38, 39, 40, 41, 42, 43, 44). The invention further contemplates a locking assembly (33) to lock one or more bone screws (32) within a respective screw hole (34). In one embodiment, the locking assembly (33) includes a washer (90) overlapping one or more screw holes (34), and a locking screw (85). In another embodiment, a locking washer (120) includes cut-outs (128) corresponding to the screw recesses (105), along with a notch (110) and key (129) configuration.</p>		

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# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US 98/09634

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 A61B17/70 A61B17/80

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 A61B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 96 29948 A (SYNTHESE) 3 October 1996 see page 2, line 1 - line 14 see page 5, line 1 - page 6, line 11; figures 5-7	1
X	WO 94 17744 A (DANEK MEDICAL) 18 August 1994	2
A	see figures 1,5	6,8
X	FR 2 519 857 A (J.J.M.BUTEL AND TORNIER) 22 July 1983	2
A	see claim 3; figures 2,3	3
X	EP 0 599 640 A (CODMAN & SHURTLEFF) 1 June 1994 see column 5, line 25 - line 39 see column 2, line 22 - line 26; figures 6A-6B	2,4
	-/-	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

10 December 1998

Date of mailing of the international search report

23.12.98

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# INTERNATIONAL SEARCH REPORT

International Application No

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2 740 321 A (J.M.FUENTES) 30 April 1997 see abstract; figures 1-3 see page 6, line 6 - line 9 ---	2,5,7
A	EP 0 251 583 A (PFIZER HOSPITAL PRODUCTS) 7 January 1988 see column 18, line 15 - line 29 see column 20, line 53 - column 21, line 41; figures 7,16 ---	1
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# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US 98/09634

## Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
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Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claim : 1

Bone plate with pivoting bone fasteners and non-pivoting bone fasteners

2. Claims: 2-8

Bone plate with locking screw assembly

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 98/09634

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